UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

MAR 3 1 2010

Linda MacGregor
Chief, Watershed Protection Branch
Environmental Protection Division
Georgia Department of Natural Resources
4220 International Parkway
Suite 101
Atlanta, GA 30354

Dear Ms. MacGregor:

The purpose of this letter is to summarize the Environmental Protection Agency's (EPA's) review of the Georgia Environmental Protection Division's (EPD's) revisions to Chapter 391-3-6-.03 of Georgia's Rules and Regulations for Water Quality Control. The revisions were adopted as a result of EPD's triennial review of water quality standards, as required under the provisions of Clean Water Act (CWA or the Act) § 303(c).

The revisions to 391-3-6-.03 adopted by the State during the triennial review include the following:

- Revisions to 391-3-6-.03(2)(f) and (g) which clarify the purpose and uses for variances and removal of designated uses;
- Revisions to definitions of two terms in 391-3-6-.03(3)(i) which are used in Georgia's water quality standards regulation;
- Revisions to water quality criteria listed in 391-3-6-.03(5)(e)(ii), (iii), and (iv) based on EPA's CWA § 304(a) criteria guidance for priority pollutants;
- Revision of the dissolved oxygen criteria for the Coastal Fishing designated use in 391-3-6-.03(6)(f);
- Adoption of a mechanism in 391-3-6-.03(13) for use in the consideration of data that was not collected under an approved sampling and quality assurance plan in making water quality management decisions;
- Revisions to the frequency component of the water quality criteria in 391-3-6-.03(17) for chlorophyll *a* for six lakes; and

- Grammatical changes, editorial changes, and other revisions related to renumbering and or arrangement of the codification of various provisions in Chapter 391-3-6-.03.

The State held public hearings on the proposed triennial review revisions on August 14, 15 and 18, 2008. Based on a review of comments received, three revisions were made to the proposal, and the State held an additional public hearing on the revised proposal on November 3, 2008. The revisions proposed during these comment periods were adopted by the Board of Natural Resources on December 3, 2008. The new and revised water quality standards were submitted to EPA by letter dated July 28, 2009.

The State's July 28, 2009, letter submitting the new and revised standards to EPA included a certification letter dated May 6, 2009, signed by Thurbert E. Baker, Georgia Attorney General. Subsequent to discussions between EPA and EPD, the State submitted a revised certification on the triennial review revisions by letter dated October 8, 2009. The revised certification stated, "the revisions to the Rules of the Board of Natural Resources amending Rule 391-3-6-.03, including 'Water Use Classifications and Water Quality Standards' to establish new criterion for dissolved oxygen in areas designated for coastal fishing and other modifications; adopted by the Board of Natural Resources on December 3, 2008; filed with the Georgia Secretary of State on January 29, 2009; and becoming effective twenty days or more thereafter on February 18, 2009; were duly adopted in accordance with State law."

On November 17, 2009, Georgia held an additional public hearing to receive comments on the revisions to the chlorophyll *a* criteria for West Point Lake, Lake Walter F. George, Lake Jackson, Lake Allatoona, Lake Sidney Lanier, and Carters Lake. The availability of the supporting documentation for the chlorophyll *a* criteria was announced in the public notice for the hearing and the relevant documentation was posted on EPD's web site. The State reviewed the comments received during this supplemental public review process, and submitted its responses to those comments to EPA in a letter dated December 16, 2009.

EPA has reviewed the August 2008, November 2008, and November 2009 public participation processes conducted by the State in relation to the triennial review revisions, as well as the October 2009 legal certification and determined that EPD's submittal of revised water quality standards is sufficient to comply with applicable requirements of 40 CFR Part 25 and the provisions of 40 CFR §§ 131.6 and 131.20.

New and Revised Standards that are Approved by EPA

Based on the review of the State's submittal, EPA has determined the five categories of new and revised standards listed below are consistent with 40 CFR Part 131 and CWA § 303. Therefore, EPA is approving the following new and revised water quality standards:

- Revisions to 391-3-6-.03(2)(f) and (g), which clarify the purpose and uses for variances and removal of designated uses;

- Revisions to definitions of the terms "naturally variable parameters" and "significant figures" in 391-3-6-.03(3)(i);

- Revisions to water quality criteria listed in 391-3-6-.03(5)(e)(ii), (iii), and (iv) based on EPA's CWA § 304(a) criteria guidance for priority pollutants;

- Revision of the dissolved oxygen criteria for the Coastal Fishing designated use in 391-3-6-.03(6)(f); and

- Revisions to the frequency component of the water quality criteria in 391-3-6-.03(17) for chlorophyll *a* for West Point Lake, Lake Walter F. George, Lake Jackson, Lake Allatoona, Lake Sidney Lanier, and Carters Lake.

Please note that Enclosure 1 is a copy of the revisions to water quality criteria in 391-3-6-.03(5)(e)(ii), (iii), and (iv) that are subject to EPA's approval.

Revisions to Rule 391-3-6-.03 that are not New or Revised Water Quality Standards

EPA has determined that the revisions to Rule 391-3-6-.03 that relate to the two remaining categories are not new or revised water quality standards. Therefore, EPA is not acting under CWA §303(c) authorities on the following provisions:

Adoption of a mechanism in 391-3-6-.03(13) for use in the consideration of data that was not collected under an approved sampling and quality assurance plan in making water quality management decisions

These provisions apply only to the collection of samples and the methods of analysis for samples in the implementation of the State's responsibilities of the CWA §§ 305(b) and 303(d), and do not relate to the magnitude, frequency, or duration of water quality criteria, designated uses or antidegradation. Therefore, these revisions to the regulation are not new or revised water quality standards provisions.

Grammatical changes, editorial changes, and other revisions related to renumbering and/or arrangement of the codification of various provisions in Chapter 391-3-6-.03

These revisions do not have a substantive effect on the intent or meaning of the water quality standards regulation, and do not alter the effectiveness of the standards, either individually or when taken as a whole.

Endangered Species Act

EPA's action to approve the above new and revised water quality standards is subject to consultation under § 7 of the Endangered Species Act (ESA). EPA has

prepared a Biological Evaluation of the effect of EPA's approval of these new and revised water quality standards provisions, and this Biological Evaluation has been provided to the US Fish and Wildlife Service (USFWS) for concurrence.

ESA § 7 consultations on aquatic life criteria revisions are currently being deferred to national consultation between EPA and the USFWS. Therefore, the ESA § 7 consultation on EPA's review of EPD's revisions to the State's aquatic life criteria for cadmium and pentachlorophenol, which are equal to or more protective than EPA's nationally recommended criteria, will be handled at a national level. However, EPA's approval decision on these revisions to the State's aquatic life criteria in 391-3-6-.03(5)(e)(ii) and (iii) is fully consistent with § 7(d) because it does not foreclose either the formulation by FWS or the implementation by EPA of any alternatives that, through the consultation, might be determined necessary in order to comply with § 7(a)(2). By approving the standards subject to the results of the national consultation under § 7(a)(2), EPA is expressly retaining the discretion to revise its approval decision if the consultation identifies deficiencies in the standards requiring modification by EPA. The revised criteria for cadmium and pentachlorophenol increase the level of protection afforded to waters of the State, and will provide an effect that will be beneficial. Moreover, the application of the revised standards is not anticipated to cause any impacts of concern during the interim period, until consultation is completed. Therefore, proceeding with an approval action prior to the completion of the national consultation will increase the protection that the standards provide for listed species/critical habitat during this interim period.

With respect to the revised criterion for dissolved oxygen in the Savannah Harbor, representatives of GA EPD and EPA Region 4 have previously met with members of both the U.S. Fish and Wildlife Service and the National Marine Fisheries Service (the Services) in Charleston, SC. The Services did not voice any opposition to the revised criterion and conveyed that they believe the criterion to be protective of the resources in the area, most notably the short nosed sturgeon. Additionally, because this site specific criterion is, in part, based on the application of EPA's CWA § 304(a) criteria guidance for dissolved oxygen, it will indirectly be handled under the above cited national consultation. Therefore, the approval of this criterion is consistent with § 7(d) of the Endangered Species Act out outlined above.

Issues for Follow-up Action

During review of the documents submitted to EPA in support of the 2007 – 2008 triennial review, EPA has identified three other areas of Rule 391-3-6-.03 that warrant follow-up actions by the State.

Reservoirs with Current Drinking Water Withdrawals

Based on the information presented in the study of use attainment in the six reservoirs with revised chlorophyll *a* criteria, three of these reservoirs currently serve as

water sources for municipal water supplies, but are not designated for the Drinking Water use:

Reservoir	Municipality	Segment	Current Designated ----Use----
West Point Lake	City of LaGrange	Chattahoochee River: New River to West Point Dam	Recreation
Lake Lanier	City of Gainesville	Chattahoochee River: Headwaters to Buford Dam	Recreation
Carters Lake	City of Chatsworth and City of Calhoun	Coosawattee River: Confluence to Mountaintown Creek to Carters Dam	Recreation

EPA recommends that the State revise the use classifications for these segments to be consistent with their current use as a drinking water source during the next opportunity for review of the standards. Based on conversations with EPD staff, we understand that the next triennial review will focus on compiling information on the location of water withdrawals in state waters, in order to ensure that all waters that currently serve as domestic water sources are classified for the Drinking Water use. Until that time, the State's antidegradation policy, at 391-3-6-.03(2)(b)(ii), includes the appropriate regulatory authority for protection of the existing drinking water uses for these three lakes. This provision states, "Existing instream water uses and the level of water quality necessary to protect the existing uses shall be maintained and protected."

Water Quality Criteria for Dioxin

The State updated the numeric criteria listed in 391-3-6-.03(5)(e)(iv) for the protection of human health to reflect EPA's national recommended criteria at a fish consumption rate of 17.5 grams per day. However, the water quality criterion for 2,3,7,8 tetrachlorodibenzo-p-dioxin (TCDD) in 391-3-6-.03(5)(e)(vi) was not recalculated based on the revised fish consumption rate. The State should revise the TCDD criterion in 391-3-6-.03(5)(e)(vi) during its next opportunity for revision of water quality standards.

Water Quality Criteria for Metals that are Expressed as Hardness-Dependent Equations

391-3-6-.03(5)(e)(ii) contains freshwater acute and chronic water quality criteria equations for protection of aquatic life that are expressed as a function of hardness in the

water column for the following metals: cadmium, chromium III, copper, lead, nickel, and zinc. These criteria equations include a minimum hardness cutoff of 25 mg/L calcium carbonate. EPA notes that the minimum cutoffs for these six metals were adopted at the time that these criteria were initially adopted by the State. On May 25, 2005, EPA published a compilation of national recommended water quality criteria in a summary table. (See http://www.epa.gov/waterscience/criteria/wqctable/). The freshwater aquatic life criteria for these six parameters published by EPA do not include a minimum hardness cutoff. We recommended that the State revise the criteria for these metals to delete the minimum hardness cutoff from each criteria equation during the next opportunity for revision of water quality standards.

Future Development of Guidance for UAAs

Also, in response to a comment on the adopted revisions to 391-3-6-.03(2)(g), regarding the availability of State guidance documents for conducting a UAA, Georgia stated, "[t]he State has not developed guidance for conducting use attainability analyses at this time, but may do so in the future." Should the State pursue development of additional guidance documents for the implementation of the variance or use removal provisions of Georgia water quality standards in the future, EPA Region 4 staff are available, if needed, to offer assistance in the development of such implementation guidance documents. Also, if those guidance documents are adopted as State regulations, those revisions to Georgia water quality standards should be submitted to EPA for review under CWA § 303(c) authorities.

Review of Nutrient Criteria

In its response to comments requesting a re-evaluation of the chlorophyll *a* criteria for West Point Lake, EPD stated, "[t]he re-evaluation of the criteria will take considerable time and effort and will also need to be open to a full public participation process. EPD therefore plans to undertake this proposal in the near future, when the hydrologic and water quality modeling of the lake and the watershed are complete. The nutrient data will also be evaluated and the nutrient criteria for West Point Lake will be revised, if necessary." EPA supports the State's effort in reviewing the chlorophyll *a* criteria for West Point Lake, and asks that EPD continue to provide updates on that effort.

We also suggest that the availability of additional data for the six lakes, i.e., since the time of initial adoption of criteria for chlorophyll *a*, is an opportunity for EPD to review the magnitude component of these criteria during future water quality standards reviews. For example, Jackson Lake experienced a cyanobacterial bloom during the fall of 2007, resulting in a precautionary lake-wide health advisory for recreational water contact activities. Also, taste and odor problems have occurred in water withdrawn from some of these lakes during years that growing season averages were in compliance with applicable chlorophyll *a* criteria. Events such as these indicate the potential need for more stringent magnitude criteria to ensure that these waters are meeting their designated

uses. EPA will work with EPD within the framework of the State Nutrient Criteria Development Plan to include reviews of data for all six lakes in the future.

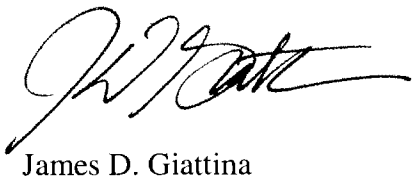
In 1998, EPA issued the *National Strategy for the Development of Regional Nutrient Criteria* and the *Water Quality and Standards Plan – Priorities for the Future* which set out the premise that improved water quality standards were critically needed for nutrient control. In November 2001, EPA's Office of Science and Technology issued guidance (known as 'The Grubbs Memo") to states to request that each state develop a nutrient criteria plan to outline the specific strategy, milestones and schedule to develop nutrient criteria. States were asked to take downstream effects into account as they developed criteria. That guidance was the impetus for the development of EPA-State mutually approved plans to develop numeric criteria. Activities nationally and here in the Region have reinforced for EPA the vital importance of the development of scientifically defensible numeric nutrient water quality criteria, including reports indicating that nutrient impairment is on the rise and likely to get significantly worse. In fact, the EPA Office of Inspector General (OIG) highlighted EPA's slow progress of nutrient criteria development as well as the lack of accountability by States in meeting the goals and milestones of their plans. (*"EPA Needs to Accelerate Adoption of Numeric Nutrient Water Quality Standards", Report No. 09-P-0223*, August 26, 2009).

EPD should move forward on developing a process and schedule for addressing total nitrogen, total phosphorus and clarity in the state's waters. In addition, EPD should develop a process and schedule for addressing protection of downstream waters, particularly lakes and estuaries. As you are aware, EPA is developing numeric nutrient criteria for Florida's lakes and flowing waters. When these criteria become effective, it will be necessary for Georgia to meet these criteria at the Georgia-Florida state line. We look forward to working with you on these efforts.

The State's new and revised standards will result in the use of defensible and protective water quality criteria that are applicable to all waters of the State, and will provide additional clarity and specificity to the implementation of the water quality standards regulation. These revisions will result in more effective regulation of water quality in the State. The revisions to Georgia water quality standards approved by EPA

are now effective for all purposes of the Clean Water Act. If you have any questions regarding this action by EPA, please call me at 404-562-9470 or have your staff contact Fritz Wagener at 404-562-9267.

Sincerely,



James D. Giattina
Director
Water Management Division

Enclosure

cc: Elizabeth Booth, EPD

ENCLOSURE 1:

Revisions to Water Quality Criteria in 391-3-6-.03(5)(e)(ii), (iii), and (iv) Subject to EPA's Approval CWA Section 303(c) Approval

~~(l)~~ (n) "Water" or "waters of the State" means any and all rivers, streams, creeks, branches, lakes, reservoirs, ponds, drainage systems, springs, wells, wetlands, and all other bodies of surface or subsurface water, natural or artificial, lying within or forming a part of the boundaries of the State which are not entirely confined and retained completely upon the property of a single individual, partnership, or corporation.

~~(m)~~ (o) "Areas where salt, fresh and brackish waters mix" are those areas on the coast of Georgia having a salinity of 0.5 parts per thousand and greater. This includes all of the creeks, rivers, and sounds of the coastal area of Georgia and portions of the Savannah, Ogeechee, Altamaha, Satilla and St. Marys Rivers where those rivers flow into coastal sounds. Mixing areas are generally maintained by seawater transported through the sounds by tide and wind which is mixed with fresh water supplied by land runoff, subsurface water and river flow. Mixing areas have moving boundaries based upon but not limited to river stage, rainfall, moon phase and water use. (For the purposes of this rule salinity shall be analyzed by in situ measurement using a properly calibrated multi-parametric probe connected by hard line to a deck display or by measuring electrical conductivity according to one of the methods specified in *Title 40, Code of Federal Regulations, Part 136* and applying the guidance for conversion to salinity in the same volume. Collection of salinity samples must consider riverflow, precipitation, tidal influences and other variables of the estuarine environment and must conform to the *National Coastal Assessment-Quality Assurance Project Plan 2001-2004* (EPA/620/R-01/002). Measurements at each sampling location must be made in a distribution in the water column according to the *Quality Assurance Project Plan*, with the minimum observations at each station including surface, mid-depth and near-bottom readings. In situ salinity analysis must comply with the *Quality Assurance Project Plan* and the manufacturer's guidance for the specific instrument used).

(4) **Water Use Classifications.** Water use classifications for which the criteria of this Paragraph are applicable are as follows:

(a) Drinking Water Supplies
(b) Recreation
(c) Fishing, Propagation of Fish, Shellfish, Game and Other Aquatic Life
(d) Wild River
(e) Scenic River
(f) Coastal Fishing

(5) **General Criteria for All Waters.** The following criteria are deemed to be necessary and applicable to all waters of the State:

(a) All waters shall be free from materials associated with municipal or domestic sewage, industrial waste or any other waste which will settle to form sludge deposits that become putrescent, unsightly or otherwise objectionable.

(b) All waters shall be free from oil, scum and floating debris associated with municipal or domestic sewage, industrial waste or other discharges in amounts sufficient to be unsightly or to interfere with legitimate water uses.

(c) All waters shall be free from material related to municipal, industrial or other discharges which produce turbidity, color, odor or other objectionable conditions which interfere with legitimate water uses.

(d) Turbidity. The following standard is in addition to the narrative turbidity standard in Paragraph 391-3-6-.03(5)(c) above:

All waters shall be free from turbidity which results in a substantial visual contrast in a water body due to a man-made activity. The upstream appearance of a body of water shall be as observed at a point immediately upstream of a turbidity-causing man-made activity. That upstream appearance shall be compared to a point which is located sufficiently downstream from the activity so as to provide an appropriate mixing zone. For land disturbing activities, proper design, installation, and maintenance of best management practices and compliance with issued permits shall constitute compliance with Paragraph 391-3-6-.03(5)(d).

(e) All waters shall be free from toxic, corrosive, acidic and caustic substances discharged from municipalities, industries or other sources, such as nonpoint sources, in amounts, concentrations or combinations which are harmful to humans, animals or aquatic life.

(i) Instream concentrations of the following chemical constituents which are considered to be other toxic pollutants of concern in the State of Georgia shall not exceed the criteria indicated below under 7-day, 10-year minimum flow (7Q10) or higher stream flow conditions except within established mixing zones:

1. 2,4-Dichlorophenoxyacetic acid (2,4-D)	70 ~~µg/l~~µg/L
2. Methoxychlor	0.03 ~~µg/l~~µg/L *
3. 2,4,5-Trichlorophenoxy propionic acid (TP Silvex)	50 ~~µg/l~~µg/L

(ii) Instream concentrations of the following chemical constituents listed by the U.S. Environmental Protection Agency as toxic priority pollutants pursuant to Section 307(a)(1) of the Federal Clean Water Act (as amended) shall not exceed the acute criteria indicated below under 1-day, 10-year minimum flow (1Q10) or higher stream flow conditions and shall not exceed the chronic criteria indicated below under 7-day, 10-year minimum flow (7Q10) or higher stream flow conditions except within established mixing zones or in accordance with site specific effluent limitations developed in accordance with procedures presented in 391-3-6-.06. Unless otherwise specified, the criteria below are listed in their total recoverable form. Because most of the numeric criteria for the metals below are listed as the dissolved form, total recoverable concentrations of metals that are measured instream will need to be translated to the dissolved form in order to compare the instream data with the numeric criteria. This translation will be performed using guidance found in "Guidance Document of Dynamic Modeling and Translators August 1993" found in Appendix J of EPA's Water Quality Standards Handbook: Second Edition, EPA-823-B-94-005a or by using other appropriate guidance from EPA.

		Acute	Chronic
1.	Arsenic		
	(a) Freshwater	340 ~~µg/l~~µg/L [1]	150 ~~µg/l~~µg/L [1]
	(b) Coastal and Marine Estuarine Waters	69 ~~µg/l~~µg/L [1]	36 ~~µg/l~~µg/L [1]
2.	Cadmium		
	(a) Freshwater	~~2.0~~ 1.0 ~~µg/l~~µg/L [1, 3]	~~1.3 µg/l~~ 0.15 µg/L ~~µg/l~~ [1, 3]
	(b) Coastal and Marine Estuarine Waters	~~42~~40 ~~µg/l~~µg/L [1]	~~9.3 µg/l~~ 8.8 µg/L [1]
3.	Chromium III		
	(a) Freshwater	320 ~~µg/l~~µg/L [1,3]	42 ~~µg/l~~µg/L [1,3]
	(b) Coastal and Marine Estuarine Waters	--	--
4.	Chromium VI		
	(a) Freshwater	16 ~~µg/l~~µg/L [1]	11 ~~µg/l~~µg/L [1]
	(b) Coastal and Marine Estuarine Waters	1,100 ~~µg/l~~µg/L [1]	50 ~~µg/l~~µg/L [1]
5.	Copper		
	(a) Freshwater	7.0 ~~µg/l~~µg/L [1,2*,3]	5.0 ~~µg/l~~µg/L [1,2*,3]
	(b) Coastal and Marine Estuarine Waters	4.8 ~~µg/l~~µg/L [1,2]	3.1 ~~µg/l~~µg/L [1,2]
6.	Lead		
	(a) Freshwater	30 ~~µg/l~~µg/L [1,3]	1.2 ~~µg/l~~µg/L [1,2*,3]
	(b) Coastal and Marine Estuarine Waters	210 ~~µg/l~~µg/L [1]	8.1 ~~µg/l~~µg/L [1]
7.	Mercury		
	(a) Freshwater	1.4 ~~µg/l~~µg/L	0.012 ~~µg/l~~µg/L [2]
	(b) Coastal and Marine Estuarine Waters	1.8 ~~µg/l~~µg/L	0.025 ~~µg/l~~µg/L [2]
8.	Nickel		
	(a) Freshwater	260 ~~µg/l~~µg/L [1,3]	29 ~~µg/l~~µg/L [1,3]
	(b) Coastal and Marine Estuarine Waters	74 ~~µg/l~~µg/L [1]	8.2 ~~µg/l~~µg/L [1]
9.	Selenium		
	(a) Freshwater	--	5.0 ~~µg/l~~µg/L
	(b) Coastal and Marine Estuarine Waters	290~~µg/l~~µg/L [1]	71 ~~µg/l~~µg/L [1]
10.	Silver	-- [4]	-- [4]
11.	Zinc		
	(a) Freshwater	65 ~~µg/l~~µg/L [1,3]	65 ~~µg/l~~µg/L [1,3]
	(b) Coastal and Marine Estuarine Waters	90 ~~µg/l~~µg/L [1]	81 ~~µg/l~~µg/L [1]
12.	Lindane [Hexachlorocyclohexane (g-BHC-Gamma)]		
	(a) Freshwater	0.95 ~~µg/l~~µg/L	
	(b) Coastal and Marine Estuarine Waters	0.16 ~~µg/l~~µg/L	

[1] The in-stream criterion is expressed in terms of the dissolved fraction in the water column. Conversion factors used to calculate dissolved criteria are found in the EPA document – National Recommended Water Quality Criteria – ~~Correction,~~ EPA 2006 ~~822-Z-99-001, April 1999~~.

[2] The in-stream criterion is lower than the EPD laboratory detection limits (A "*" indicates that the criterion may be higher than or lower than EPD laboratory detection limits depending upon the hardness of the water).

[3] The freshwater aquatic life criteria for these metals are expressed as a function of total hardness (~~mg/l~~mg/L) in a water body. Values in the table above assume a hardness of 50 ~~mg/l~~mg/L CaCO3. For other hardness values, the following equations from the EPA document – National Recommended Water Quality Criteria – ~~Correction,~~ EPA 2006 ~~822-Z-99-001, April 1999~~ should be used. The minimum hardness allowed for use in these equations shall not be less than 25 ~~mg/l~~mg/L, as calcium carbonate and the maximum shall not be greater than 400 ~~mg/l~~mg/L as calcium carbonate.

Cadmium
acute criteria = $(e^{(1.128\ 1.0166[\ln(\text{hardness})] - 3.924\ 3.6867)})(1.136672-[(\ln \text{hardness})(0.041838)]$ ~~µg/l~~µg/L
chronic criteria = $(e^{(0.7852\ 0.7409[\ln(\text{hardness})] - 4.719\ 2.716)})(1.101672-[(\ln \text{hardness})(0.041838)]$ ~~µg/l~~µg/L

~~Chromium III~~
acute criteria = $(e^{(0.8190[\ln(\text{hardness})] + 3.7256)})(0.316)$ ~~µg/l~~µg/L
chronic criteria = $(e^{(0.8190[\ln(\text{hardness})] + 0.6848)})(0.860)$ ~~µg/l~~µg/L

Copper
acute criteria = $(e^{(0.9422[\ln(\text{hardness})] - 1.700)})(0.96)$ ~~µg/l~~µg/L
chronic criteria = $(e^{(0.8545[\ln(\text{hardness})] - 1.702)})(0.96)$ ~~µg/l~~µg/L

Lead
acute criteria = $(e^{(1.273[\ln(\text{hardness}) - 1.460)})(1.46203 - [(\ln \text{hardness})(0.145712)])$ ~~µg/l~~µg/L
chronic criteria = $(e^{(1.273[\ln(\text{hardness}) - 4.705)})(1.46203 - [(\ln \text{hardness})(0.145712)])$ ~~µg/l~~µg/L

Nickel
acute criteria = $(e^{(0.8460[\ln(\text{hardness})] + 2.255)})(.998)$ ~~µg/l~~µg/L
chronic criteria = $(e^{(0.8460[\ln(\text{hardness})] + 0.0584)})(.997)$ ~~µg/l~~µg/L

Zinc
acute criteria = $(e^{(0.8473[\ln(\text{hardness})] + 0.884)})(0.978)$ ~~µg/l~~µg/L
chronic criteria = $(e^{(0.8473[\ln(\text{hardness})] + 0.884)})(0.986)$ ~~µg/l~~µg/L

[4] This pollutant is addressed in 391-3-6-.06.

(iii) Instream concentrations of the following chemical constituents listed by the U.S. Environmental Protection Agency as toxic priority pollutants pursuant to Section 307(a)(1) of the Federal Clean Water Act (as amended) shall not exceed criteria indicated below under 7-day, 10-year minimum flow (7Q10) or higher stream flow conditions except within established mixing zones or in accordance with site specific effluent limitations developed in accordance with procedures presented in 391-3-6-.06.

1.	Chlordane (CAS RN[1] 57749)	
	(a) Freshwater	0.0043 ~~µg/l~~µg/L*
	(b) Coastal and Marine Estuarine Waters	0.004 ~~µg/l~~µg/L*
2.	Cyanide (CAS RN[1] 57125)	
	(a) Freshwater	5.2 ~~µg/l~~µg/L*
	(b) Coastal and Marine Estuarine Waters	1.0 ~~µg/l~~µg/L*
3.	Dieldrin (CAS RN[1] 60571)	
	(a) Freshwater	0.056 ~~µg/l~~µg/L*
	(b) Coastal and Marine Estuarine Waters	0.0019 ~~µg/l~~µg/L*
4.	4,4'-DDT (CAS RN[1] 50293)	0.001 ~~µg/l~~µg/L*
5.	a-Endosulfan (CAS RN[1] 959988)	
	(a) Freshwater	0.056 ~~µg/l~~µg/L*
	(b) Coastal and Marine Estuarine Waters	0.0087 ~~µg/l~~µg/L*
6.	b-Endosulfan (CAS RN[1] 33213659)	
	(a) Freshwater	0.056 ~~µg/l~~µg/L*
	(b) Coastal and Marine Estuarine Waters	0.0087 ~~µg/l~~µg/L*
7.	Endrin (CAS RN[1] 72208)	
	(a) Freshwater	0.036 ~~µg/l~~µg/L*
	(b) Coastal and Marine Estuarine Waters	0.0023 ~~µg/l~~µg/L*
8.	Heptachlor (CAS RN[1] 76448)	
	(a) Freshwater	0.0038 ~~µg/l~~µg/L*
	(b) Coastal and Marine Estuarine Waters	0.0036~~µg/l~~µg/L*
9.	Heptachlor Epoxide (CAS RN[1] 1024573)	
	(a) Freshwater	0.0038 ~~µg/l~~µg/L*
	(b) Coastal and Marine Estuarine Waters	0.0036 ~~µg/l~~µg/L*
10	Pentachlorophenol (CAS RN[1] 87865)	
	(a) Freshwater[2]	~~2.1 µg/l~~ 15 ~~µg/l~~µg/L[2,*]
	(b) Coastal and Marine Estuarine Waters	7.9 ~~µg/l~~µg/L*
11.	PCBs	
	(a) Freshwater	0.014 ~~µg/l~~µg/L*
	(b) Coastal and Marine Estuarine Waters	0.03 ~~µg/l~~µg/L*
12.	Phenol (CAS RN[1] 108952)	300 ~~µg/l~~µg/L
13.	Toxaphene (CAS RN[1] 8001352)	0.0002 ~~µg/l~~µg/L*

[1]"CAS RN" or the Chemical Abstract Service (CAS) Registry Number is a unique numerical identifier assigned to each chemical and some chemical mixtures.

[2]The instream freshwater criterion for pentachlorophenol is a function of pH, determined by the formula ($e^{(1.005(pH) - 5.134)}$). At a pH equal to 7.8 standard units the criterion is 15 µg/L.

*The in-stream criterion is lower than the EPD laboratory detection limits.

(iv) Instream concentrations of the following chemical constituents listed by the U. S. Environmental Protection Agency as toxic priority pollutants pursuant to Section 307(a)(1) of the Federal Clean Water Act (as amended) shall not exceed criteria ~~indicated below under annual average or higher stream flow conditions:~~

1.	Acenaphthene (CAS RN[1] 83329)	~~2700 µg/l~~ 990 µg/L
2.	Acenaphthylene (CAS RN[1] 208968)	**
3.	Acrolein (CAS RN[1] 107028)	~~780 µg/l~~ 9.3 µg/L
4.	Acrylonitrile (CAS RN[1] 107131)	~~0.66µg/l~~ 0.25 µg/L
5.	Aldrin (CAS RN[1] 309002)	~~0.00014 µg/l~~ 0.000050 µg/L
6.	Anthracene (CAS RN[1] 120127)	~~110000 µg/l~~ 40000 µg/L
7.	Antimony	~~4300 µg/l~~ 640 µg/L
8.	Arsenic (Total)	
	(a) Drinking Water Supplies	10 ~~µg/l~~µg/L
	(b) All Other Classifications	50 ~~µg/l~~µg/L
9.	Benzidine (CAS RN[1] 92875)	~~0.00054 µg/l~~ 0.0002 µg/L
10.	Benzo(a)Anthracene (CAS RN[1] 56553)	~~0.049 µg/l~~ 0.018 µg/L
11.	Benzo(a)Pyrene (CAS RN[1])	~~0.049 µg/l~~ 0.018 µg/L
12.	3,4-Benzofluoranthene (CAS RN[1] 205992)	~~0.049 µg/l~~ 0.018 µg/L
13.	Benzene (CAS RN[1] 71432)	~~71 µg/l~~ 51 µg/L
14.	Benzo(ghi)Perylene (CAS RN[1] 191242)	**
15.	Benzo(k)Fluoranthene (CAS RN[1] 207089)	~~0.049 µg/~~ 0.018 µg/L
16.	Beryllium	**

17.	a-BHC-Alpha (CAS RN[1] 319846)	~~0.013 µg/l~~ 0.0049 µg/L
18.	b-BHC-Beta (CAS RN[1] 319857)	~~0.046 µg/l~~ 0.017 µg/L
19.	Bis(2-Chloroethyl)Ether (CAS RN[1] 111444)	~~1.4 µg/l~~ 0.53 µg/L
20.	Bis(2-Chloroisopropyl)Ether (CAS RN[1] 108601)	~~170000 µg/l~~ 65000 µg/L
21.	Bis(2-Ethylhexyl)Phthalate (CAS RN[1] 117817)	~~5.9 µg/l~~ 2.2 µg/L
22.	Bromoform (Tribromomethane) (CAS RN[1] 75252)	~~360 µg/l~~ 140 µg/L
23.	Butylbenzyl Phthalate (CAS RN[1] 85687)	~~5200 µg/l~~ 1900 µg/L
24.	Carbon Tetrachloride (CAS RN[1] 56235)	~~4.4 µg/l~~ 1.6 µg/L
25.	Chlorobenzene (CAS RN[1] 108907)	~~21000 µg/l~~ 1600 µg/L
26.	Chlorodibromomethane (CAS RN[1] 124481)	~~34 µg/l~~ 13 µg/L
27.	2-Chloroethylvinyl Ether (CAS RN[1] 110758)	**
28.	Chlordane (CAS RN[1] 57749)	~~0.0022 µg/l~~ 0.00081 µg/L
29.	Chloroform (Trichloromethane) (CAS RN[1] 67663)	~~470 µg/l~~ µg/L
30.	2-Chloronaphthalene (CAS RN[1] 91587)	~~4300 µg/l~~ 1600 µg/L
31.	2-Chlorophenol (CAS RN[1] 95578)	~~400 µg/l~~ 150 µg/L
32.	Chrysene (CAS RN[1] 218019)	~~0.049 µg/l~~ 0.018 µg/L
33.	Dibenzo(a,h)Anthracene (CAS RN[1] 53703)	~~0.049 µg/l~~ 0.018 µg/L
34.	Dichlorobromomethane (CAS RN[1] 75274)	~~46 µg/l~~ 17 µg/L
35.	1,2-Dichloroethane (CAS RN[1] 107062)	~~99 µg/l~~ 37 µg/L
36.	1,1-Dichloroethylene (CAS RN[1] 75354)	~~3.2 µg/l~~ 7100 µg/L
37	1,2 – Dichloropropane (CAS RN[1] 78875)	~~39 µg/l~~ 15 µg/L
38.	1,3-Dichloropropylene (CAS RN[1] 542756)	~~1700 µg/l~~ 21 µg/L
39.	2,4-Dichlorophenol (CAS RN[1] 120832)	~~790 µg/l~~ 290 µg/L
40.	1,2-Dichlorobenzene (CAS RN[1] 95501)	~~17000 µg/l~~ 1300 µg/L
41.	1,3-Dichlorobenzene (CAS RN[1] 541731)	~~2600 µg/l~~ 960 µg/L
42.	1,4-Dichlorobenzene (CAS RN[1] 106467)	~~2600 µg/l~~ 190 µg/L
43.	3,3'-Dichlorobenzidine (CAS RN[1])	~~0.077 µg/l~~ 0.028 µg/L
44.	4,4'-DDT (CAS RN[1] 50293)	~~0.00059 µg/l~~ 0.00022 µg/L
45.	4,4'-DDD (CAS RN[1] 72548)	~~0.00084 µg/l~~ 0.00031 µg/L
46.	4,4'-DDE (CAS RN[1] 72559)	~~0.00059 µg/l~~ 0.00022 µg/L
47.	Dieldrin (CAS RN[1] 60571)	~~0.00014 µg/l~~ 0.000054 µg/L
48.	Diethyl Phthalate (CAS RN[1] 84662)	~~120000 µg/l~~ 44000 µg/L
49.	Dimethyl Phthalate(CAS RN[1] 131113)	~~2900000 µg/l~~ 1100000 µg/L
50.	2,4-Dimethylphenol (CAS RN[1] 105679)	~~2300 µg/l~~ 850 µg/L
51.	2,4-Dinitrophenol (CAS RN[1] 51285)	~~14000 µg/l~~ 5300 µg/L I
52.	Di-n-Butyl Phthalate (CAS RN[1] 84742)	~~12000 µg/l~~ 4500 µg/L
53.	2,4-Dinitrotoluene (CAS RN[1] 121142)	~~9.1 µg/l~~ 3.4 µg/L
54.	1,2-Diphenylhydrazine (CAS RN[1] 122667)	~~0.54 µg/l~~ 0.20 µg/L
55.	Endrin (CAS RN[1] 72208)	~~0.81 µg/l~~ 0.060 µg/L
56.	Endrin Aldehyde (CAS RN[1] 7421934)	~~0.81 µg/l~~ 0.30 µg/L
57.	alpha – Endosulfan (CAS RN[1] 959988)	~~240 µg/l~~ 89 µg/L
58.	beta – Endosulfan (CAS RN[1] 33213659)	~~240 µg/l~~ 89 µg/L
59.	Endosulfan Sulfate (CAS RN[1] 1031078)	~~240 µg/l~~ 89 µg/L
60.	Ethylbenzene (CAS RN[1] 100414)	~~29000 µg/l~~ 2100 µg/L
61.	Fluoranthene (CAS RN[1] 206440)	~~370 µg/l~~ 140 µg/L
62.	Fluorene (CAS RN[1] 86737)	~~14000 µg/l~~ 5300 µg/L
63.	Heptachlor (CAS RN[1] 76448)	~~0.00021 µg/l~~ 0.000079 µg/L
64.	Heptachlor Epoxide (CAS RN[1] 1024573)	~~0.00011 µg/l~~ 0.000039 µg/L
65.	Hexachlorobenzene (CAS RN[1] 118741)	~~0.00077 µg/l~~ 0.00029 µg/L
66.	Hexachlorobutadiene (CAS RN[1] 87683)	~~50 µg/l~~ 18 µg/L
67.	Hexachlorocyclopentadiene (CAS RN[1] 77474)	~~17000 µg/l~~ 1100 µg/L
68.	Hexachloroethane (CAS RN[1] 67721)	~~8.9 µg/l~~ 3.3 µg/L
69.	Indeno(1,2,3-cd)Pyrene (CAS RN[1] 193395)	~~0.049 µg/l~~ 0.018 µg/L
70.	Isophorone (CAS RN[1] 78591)	~~2600 µg/l~~ 960 µg/L
71.	Lindane [Hexachlorocyclohexane (g-BHC-Gamma)] (CAS RN[1] 58899)	~~0.063 µg/l~~ 1.8 µg/L
72.	Methyl Bromide (Bromomethane) (CAS RN[1] 74839)	~~4000 µg/l~~ 1500 µg/L
73.	Methyl Chloride (Chloromethane) (CAS RN[1] 74873)	**
74.	Methylene Chloride (CAS RN[1] 75092)	~~1600 µg/l~~ 590 µg/L
75.	2-Methyl-4,6-Dinitrophenol (CAS RN[1] 534521)	~~765 µg/l~~ 280 µg/L
76.	3-Methyl-4-Chlorophenol (CAS RN[1] 59507)	**
77.	Nitrobenzene (CAS RN[1] 98953)	~~1900 µg/l~~ 690 µg/L
78.	N-Nitrosodimethylamine (CAS RN[1] 62759)	~~8.1 µg/l~~ 3.0 µg/L
79.	N-Nitrosodi-n-Propylamine (CAS RN[1] 621647)	~~1.4 µg/l~~ 0.51 µg/L
80.	N-Nitrosodiphenylamine (CAS RN[1] 86306)	~~16 µg/l~~ 6.0 µg/L
81.	PCBs	~~0.00017 µg/l~~ 0.000064 µg/L
82.	Pentachlorophenol (CAS RN[1] 87865)	~~8.2 µg/l~~ 3.0 µg/L
83.	Phenanthrene (CAS RN[1] 85018)	**
84.	Phenol (CAS RN[1] 108952)	~~4,600,000 µg/l~~ 857000 µg/L
85.	Pyrene (CAS RN[1] 129000)	~~11,000 µg/l~~ 4000 µg/L

86.	1,1,2,2-Tetrachloroethane (CAS RN[1] 79345)	~~11 µg/l~~ 4.0 µg/L
87.	Tetrachloroethylene (CAS RN[1] 127184)	~~8.85 µg/l~~ 3.3 µg/L
88.	Thallium	~~6.3 µg/l~~ 0.47 µg/L
89.	Toluene (CAS RN[1] 108883)	~~200000 µg/l~~ 5980 µg/L
90.	Toxaphene (CAS RN[1] 8001352)	~~0.00075 µg/l~~ 0.00028 µg/L
91.	1,2-Trans-Dichloroethylene (CAS RN[1] 156605)	~~140000 µg/l~~ 10000 µg/L
92.	1,1,2-Trichloroethane (CAS RN[1] 79005)	~~42 µg/l~~ 16 µg/L
93.	Trichloroethylene (CAS RN[1] 79016)	~~81 µg/l~~ 30 µg/L
94.	2,4,6-Trichlorophenol (CAS RN[1] 88062)	~~6.5 µg/l~~ 2.4 µg/L
95.	1,2,4-Trichlorobenzene (CAS RN[1] 120821)	~~940 µg/l~~ 70 µg/L
96.	Vinyl Chloride (CAS RN[1] 75014)	~~525 µg/l~~ 2.4 µg/L

[1]"CAS RN" or the Chemical Abstract Service (CAS) Registry Number is a unique numerical identifier assigned to each chemical and some chemical mixtures.

** These pollutants are addressed in 391-3-6-.06.

(v) Site specific criteria for the following chemical constituents will be developed on an as-needed basis through toxic pollutant monitoring efforts at new or existing discharges that are suspected to be a source of the pollutant at levels sufficient to interfere with designated uses:

1. Asbestos

(vi) Instream concentrations of 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) must not exceed 0.0000012 ~~µg/l~~µg/L under long-term average stream flow conditions.

(vii) Mercury: For the protection of human health, total mercury concentrations bioaccumulating in a waterbody, in a representative population of fish, shellfish and/or other seafood representing different trophic levels, shall not exceed a total mercury concentration in edible tissues of 0.3 mg/kg wet weight. This standard is in accord with the USEPA *Water Quality Criterion for the Protection of Human Health: Methylmercury*, (January 2001, EPA-823-R-01-001), and because nearly 100% of the mercury in fish tissue is methylmercury, adoption of the standard as total mercury is an additional conservative measure. The representative fish tissue total mercury concentration for a waterbody is determined by calculating a Trophic-Weighted Residue Value, as described by the Georgia EPD Protocol (October 19, 2001).

(f) Applicable State and Federal requirements and regulations for the discharge of radioactive substances shall be met at all times.

(g) The dissolved oxygen criteria as specified in individual water use classifications shall be applicable at a depth of one meter below the water surface; in those instances where depth is less than two meters, the dissolved oxygen criterion shall be applied at a mid-depth. On a case specific basis, alternative depths may be specified.

(6) **Specific Criteria for Classified Water Usage.** In addition to the general criteria, the following criteria are deemed necessary and shall be required for the specific water usage as shown:

(a) Drinking Water Supplies: Those waters approved as a source for public drinking water systems permitted or to be permitted by the Environmental Protection Division. Waters classified for drinking water supplies will also support the fishing use and any other use requiring water of a lower quality.

(i) Bacteria: For the months of May through October, when water contact recreation activities are expected to occur, fecal coliform not to exceed a geometric mean of 200 per 100 ml based on at least four samples collected from a given sampling site over a 30-day period at intervals not less than 24 hours. Should water quality and sanitary studies show fecal coliform levels from non-human sources exceed 200/100 ml (geometric mean) occasionally, then the allowable geometric mean fecal coliform shall not exceed 300 per 100 ml in lakes and reservoirs and 500 per 100 ml in free flowing freshwater streams. For the months of November through April, fecal coliform not to exceed a geometric mean of 1,000 per 100 ml based on at least four samples collected from a given sampling site over a 30-day period at intervals not less than 24 hours and not to exceed a maximum of 4,000 per 100 ml for any sample. The State does not encourage swimming in surface waters since a number of factors which are beyond the control of any State regulatory agency contribute to elevated levels of fecal coliform.

(ii) Dissolved oxygen: A daily average of 6.0 ~~mg/l~~mg/L and no less than 5.0 ~~mg/l~~mg/L at all times for waters designated as trout streams by the Wildlife Resources Division. A daily average of 5.0 ~~mg/l~~mg/L and no less than 4.0 ~~mg/l~~mg/L at all times for water supporting warm water species of fish.

(iii) pH: Within the range of 6.0 - 8.5.

(iv) No material or substance in such concentration that, after treatment by the public water treatment system, exceeds the maximum contaminant level established for that substance by the Environmental Protection Division pursuant to the Georgia Rules for Safe Drinking Water.

(v) Temperature: Not to exceed 90°F. At no time is the temperature of the receiving waters to be increased more than 5°F above intake temperature except that in estuarine waters the increase will not be more than 1.5°F. In streams designated as primary trout or smallmouth bass waters by the Wildlife Resources Division, there shall be no elevation of natural stream temperatures. In streams designated as secondary trout waters, there shall be no elevation exceeding 2°F of natural stream temperatures.

(b) Recreation: General recreational activities such as water skiing, boating, and swimming, or for any other use requiring water of a lower quality, such as recreational fishing. These criteria are not to be interpreted as encouraging water contact sports in proximity to sewage or industrial waste discharges regardless of treatment requirements: